

**Exhibit C to Agreed Order No. DE3405
Between the Department of Ecology,
USG Interiors, Inc. and the Port of Tacoma**

**Final Work Plan
Supplemental Remedial Investigation
2301 Taylor Way
Tacoma, Washington**

June 27, 2006

Prepared For:

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and

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CDM Project No. 19921.38072.Tacoma RT

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A Report Prepared For:

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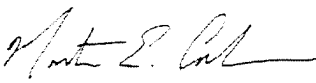
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FINAL WORK PLAN
SUPPLEMENTAL REMEDIAL INVESTIGATION
2301 TAYLOR WAY
TACOMA, WASHINGTON

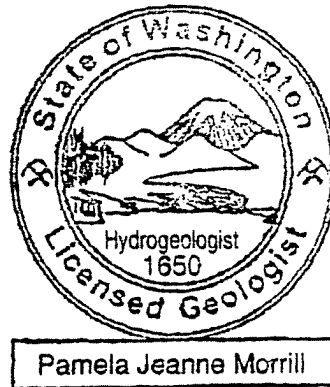
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Section 1

Introduction

1.1 General

This Supplemental Remedial Investigation (RI) Work Plan (Work Plan) has been prepared on behalf of USG Interiors, Inc. (USGI) and the Port of Tacoma (collectively referred to as the potential liable parties (PLPs) by Camp Dresser & McKee Inc. (CDM). The PLPs, or their authorized agent, will complete the work described in this Work Plan in accordance with the State of Washington Model Toxics Control Act (MTCA), Chapter 173-340 of the Washington Administrative Code (WAC) under Agreed Order No. DE3405

The Work Plan presents a technical approach for conducting a supplemental remedial investigation at the Site generally located at 2301 Taylor Way, Tacoma, Washington. As explained in Agreed Order No. DE3405 paragraph IV. 1., the Site is defined by the extent of contamination caused by the release of hazardous substances at the Site. This Work Plan is applicable to the entire Site.

1.2 Site Location and Description

The properties referenced in this Work Plan include the property at 2301 Taylor Way, Tacoma, Washington (Taylor Way Property) and two properties adjacent to the Taylor Way Property, which will be referred to as the Atofina Property, located at 2901 Taylor Way, and the Port of Tacoma Property, located at 2245 Taylor Way, 3510 Lincoln Avenue, and 3502 Lincoln Avenue (Formerly Murray Pacific Log Sort Yard #1).

The Taylor Way property was formerly owned and occupied by USGI and Thermafiber, and is now owned by the Port of Tacoma. A mineral fiber insulation manufacturing facility was demolished from the property in 2002. The Taylor Way Property is an L-shaped 9.4 acre parcel on the southwest shore of the Hylebos Waterway in Tacoma, Washington (**Figure 1**) (*USE figure 1-A from the order for this figure if appropriate*). The Taylor Way Property is partially asphalt-paved and is currently under redevelopment. **Figure 2** shows the Taylor Way Property configuration prior to demolition of the plant buildings.

The Site lies within the Commencement Bay Nearshore Tideflats Superfund Area (CBN/T). Taylor Way borders the southwest side of the Taylor Way Property. A former chemical manufacturing plant owned by Atofina (formerly ELF Atochem) borders the southeast side of the Taylor Way Property. A gravel-surfaced yard (formerly Murray Pacific Log Yard #1) that is owned by the Port of Tacoma (Port of Tacoma Property) is located to the north, and the Hylebos Waterway is located to the northeast.

1.3 Objective and Scope of Supplemental RI

The objective of the work to be completed under this Work Plan is to develop a comprehensive portrayal of existing contamination in soil and groundwater throughout the Taylor Way Property. In addition, metals concentrations on surrounding properties will be evaluated to establish their relationship with the Taylor Way Property and thus define the Site boundaries. The PLPs will accomplish the objectives of the Work Plan by following the scope of work described below:

- Summarize localized soil removal activities completed on the Taylor Way Property and residual contaminant concentrations in soil and groundwater.
- Characterize groundwater flow patterns in the surface and intermediate aquifers for the Site and immediate vicinity with the purpose of identifying potential receptors or upgradient sources to the contaminated groundwater at the Site.
- Evaluate possible sources of arsenic and other contaminants in Site groundwater.
- Conduct additional sampling and analysis of Site soils in order to fill data gaps. Specific data gaps may include, but not be limited to, the former building footprints, former paved area along southwestern side of the property near Taylor Way, southeastern boundary with Atofina, and areas of former diesel and gasoline underground storage tanks (USTs).
- Evaluate potential contaminants of concern (COC) and make a determination of Site COC.
- Develop a conceptual understanding of actual and potential exposure pathways and receptors of site COCs.
- Evaluate the effectiveness of Site interim actions (i.e., source removal activities, site paving, and stormwater retrofits) in meeting groundwater, surface water, and soil cleanup standards, particularly with respect to future development plans.

Section 2

Background

2.1 Site History

The Taylor Way Property was originally developed in the early 1940s with a carbide plant that was operated by Carbide Corp. until 1946 (Kennedy Jenks Consultants [KJC], 2002). Between 1946 and 1959, Mineral Fiber Producing Company and Feltrock Insulation Manufacturing Company owned the Taylor Way Property (KJC, 2002). In 1959 United States Gypsum Company purchased the Taylor Way Property. Ownership was transferred to subsidiaries of US Gypsum in 1985 (USG Acoustical Products Company) and again in 1987 (USGI) (KJC, 2002). USGI sold the Taylor Way Property to Thermafiber LLC (Thermafiber) in the spring of 1996. The mineral fiber manufacturing facility was closed in August 2002 and above ground structures were removed. The Port of Tacoma purchased the Taylor Way Property from Thermafiber and the Port of Tacoma currently owns the Taylor Way Property.

Mineral fiber insulation products were produced on the Taylor Way Property between 1946 and 2002. Raw materials consisting of slag and basalt rock were mixed with coke and melted in large cylindrical vessels called cupolas (KJC, 2002). The molten material was extruded into the spinning disk and expelled through a high-speed air stream to produce fine fibers. These fibers were used to make insulation. Slag obtained from ASARCO was used as raw material from about 1959 to 1973. ASARCO slag was later found to typically contain high concentrations of arsenic, copper, lead, zinc, antimony, and silver and therefore became a source of contamination on the Site.

2.2 Prior Environmental Assessment Studies

In 1994, USGI entered into Agreed Order No. DE 93 TC-S163 with Ecology to begin Site evaluation for environmental contamination. The Agreed Order followed previous voluntary source control actions implemented by USGI in the mid-1980s, which generally included removal of surface and near surface source material between the plant and the Hylebos Waterway. Initially, the Agreed Order required several phases of remedial investigation, followed by preparation of a source control plan. RI Phases I and II conducted in 1994 and 1995 by CDM (formerly AGI Technologies and Applied Geotechnology Inc. [AGI]) identified metals, primarily arsenic, in soil, groundwater, and seeps (AGI, 1994a; AGI 1995). Additional investigations included evaluation of metals concentrations in a berm formerly located along the north side of the Taylor Way Property that abuts the Port of Tacoma Property (AGI, 1996a), in seeps and sediments along the tidebank (AGI, 1997d), and in near surface soils on the southeast side of the plant buildings (AGI, 1998a), and also assessment of petroleum hydrocarbons in soil and groundwater (AGI, 1993).

In addition to the work conducted by CDM, KJC conducted a Phase I and Limited Phase II Environmental Site Assessment (ESA) in 2002 on behalf of the Port of Tacoma

(KJC, 2002) and supplemental soil sampling under the new building footprint (KJC, 2005).

2.3 Summary of Interim Actions (IA)

2.3.1 Soil-Related IA Conducted by CDM/USGI

Agreed Order No. DE 93TC-S163 was amended in August 1995 and May 1996. These amendments obligated USGI to develop plans and to conduct interim actions to control sources of metals to the Hylebos Waterway. Between 1996 and 1999 USGI undertook a series of source control actions to reduce metals concentrations (primarily arsenic) and petroleum hydrocarbons in Site soil and groundwater. Investigation and interim actions were conducted in accordance with various work plans (AGI, 1996c; AGI, 1996d; AGI 1994b; AGI 1994c). In 2005, USGI undertook an additional independent remedial action to remove contaminated soils from an area near a new warehouse building being constructed on the property. These actions are described below.

Berm Soil and Bunker C Interim Action – During the summer of 1996, a soil berm along the Taylor Way Property's north side was removed (AGI, 1996a; AGI, 1996b, AGI, 1997b). A total of 4,420 tons of soil was removed and disposed at offsite landfills. Following berm removal, about 5,000 tons of petroleum contaminated soils (PCS) related to a former Bunker C fuel tank were also excavated and properly disposed of at a permitted landfill. Short-term groundwater treatment was implemented during the cleanup. The hydrocarbon cleanup was completed as an independent remedial action.

Interim actions were completed in accordance with MTCA Method A cleanup levels in effect at the time. Following its removal, residual arsenic concentrations in soils underlying the former berm ranged between <7.5 and 210 milligrams per kilogram (mg/kg). The Method A industrial soil cleanup level for arsenic was 200 mg/kg. Subsequent PCS excavation removed an additional one-half of the soils underlying the former berm down to the native tideflat layer. Total petroleum hydrocarbons (TPH) quantified as diesel and motor oil were detected in one of the fifteen confirmatory samples collected. TPH concentrations in this one sample were below the Method A cleanup level of 200 mg/kg in effect at the time. At the conclusion of groundwater treatment, the concentration of diesel range petroleum hydrocarbons was about 1.5 milligram per liter (mg/L) - slightly above the Method A groundwater cleanup level that was in effect at the time, but well below the presumed site-specific cleanup level of 10 mg/L, which at that time was considered applicable for diesel-range petroleum hydrocarbons at industrial sites where protection of surface water applies.

Intertidal Bank Interim Action – During the summer of 1997 soil, sediment, and source materials, totaling 3,134 tons were excavated from the intertidal bank and upland area along the bank and properly disposed of at a permitted landfill (AGI,

1997a). Following excavation, the bank was reconstructed with erosion control/habitat systems approved by both state and federal regulatory and fisheries agencies. The bank interim action was formally approved by both Ecology and the U.S. Environmental Protection Agency (USEPA).

Stormwater System and Paving - During the summer of 1998, a majority of the Taylor Way Property stormwater system was replaced and new asphalt paving was placed over the Taylor Way Property areas where process by-products and raw products were temporarily stored or handled (AGI, 1998b). The old stormwater system was replaced since it had loose joints and allowed groundwater infiltration, which then discharged directly into the Hylebos Waterway.

MW9 Area Soil Excavation - During the summer of 1999, source material containing metals located along the Taylor Way Property's southeast side in the area of monitoring well MW9 was excavated and disposed of at a permitted landfill (AGI, 2000). During the MW9-area interim action, arsenic was also identified in soil on the Atofina property at the property boundary with the Taylor Way Property.

Stormwater System and Paving Completion - The remaining portion of the stormwater collection and conveyance system was replaced and paving was completed in late 1999 (AGI, 2000). As a final step in this process, the entire stormwater system was flushed and sediment/water was vacuumed from manholes/catch basins for disposal. The purpose of the flushing/cleaning was to provide Thermafiber with a clean system, which would then be maintained by Thermafiber.

Soil Removal Near Warehouse - In June and July 2005 soils were excavated from two areas referred to as the B13 and B23 excavations (CDM, 2005a). B13 and B23 were two of KJC's 2002 Phase 2 ESA test hole locations. These two excavations bounded the MW9 excavation, coming within about 40 feet of the new warehouse building that was being constructed on the site at the time. The B13 excavation occurred under the former baghouse area and the B23 excavation occurred under a former concrete pad previously used for material storage. The B13 excavation ranged between 4 and 8 ft deep and the B23 excavation ranged between 2 and 5 ft deep. In addition, an approximately 2,500 cubic yard soil stockpile that had been excavated by the Port during construction activities was disposed of. A total of 8,176 tons of soil were disposed of during this site work.

2.3.2 Soil-Related IA Conducted by Kennedy/Jenks Consultants/Port of Tacoma

During, KJC's Phase I and Limited Phase II ESA, slag, shot, and cupola bottoms were identified in the railroad spur berm that entered into the Taylor Way Property from the northwest. Chemical analysis determined that the berm fill contained high concentrations of metals, particularly arsenic, lead, and cadmium. In 2003 KJC, on behalf of Thermafiber, excavated an approximately 265 foot stretch of these berm soils

down to pre-existing grade (KJC, 2003). In June 2003, 1,000 tons of the removed berm soils were transported to Chemical Waste Management's Arlington, Oregon Subtitle C landfill for stabilization and disposal. The remaining 1,500 tons of soil classified as nonhazardous and were transported to Rabanco's Subtitle D landfill in Roosevelt, Washington. KJC did not conduct confirmation sampling beneath the berm footprint.

The Phase II ESA also identified soil containing diesel and oil-range petroleum hydrocarbons near the former boiler behind the former production facility. Between January and May 2003 approximately 4,400 tons of petroleum hydrocarbon contaminated soil were excavated and transported to Rabanco's Subtitle D landfill in Roosevelt, Washington. The excavation was dewatered to facilitate soil removal and in the process, approximately 107,000 gallons of water were pumped from the excavation. Only one-sixth of the water met the City of Tacoma's sewer discharge limits, the rest of the water was transported to Emerald Services in Seattle for treatment prior to disposal.

In August of 2005, two underground storage tanks were discovered close to a new warehouse building being constructed on the site and were removed (DLH, 2005). The tanks, 4,000 and 5,000 gallons in size, and had apparently been used to store diesel fuel, based on soil analytical testing. Soil analytical data indicated the USTs had not leaked, however arsenic concentrations in several samples exceeded the MTCA Method A unrestricted land use cleanup level of 20 mg/kg so the excavated soils were transported to the Tacoma LRI facility for disposal. Soils encountered during the UST closure consisted of five to six feet of fill overlying layers of asphalt, concrete, basecourse, and then the tideflat sediment. The UST was below the asphalt and concrete layers, indicating the tanks were installed before the property was developed with the present facility.

2.3.3 Subsequent Confirmation Sampling by CDM/USGI

Because KJC had conducted no confirmation sampling under the former railroad berm, in July 2005 CDM excavated 10 test pits through this area (CDM, 2005b). Test pit depths ranged between 3 and 4.5 ft deep. Soils were screened at approximately 1 ft intervals using an X-Ray Fluorescence (XRF) spectrometer. The XRF data were backed up by conducting laboratory analysis on a subset of the samples. Comparison of the XRF and laboratory data for arsenic showed excellent correlation where $r=0.987$.¹ The results of this investigation confirmed the variability of arsenic concentrations in site soils. With the exception of a small, isolated zone of shot

¹ A correlation coefficient is a number between -1 and 1 that measures the degree to which two variables are linearly related. If there is a perfect linear relationship with a positive slope between two variables, we have a linear correlation of 1. For example, if there is a positive correlation, whenever one variable is high, so is the other. If there is a perfect linear relationship with negative slope between two variables ($r = -1$), then there is a negative correlation. For example, if one variable has a high value, the other has a low value.

observed in one test pit, soil arsenic concentrations in this study ranged up to about 300 parts per million.

2.3.4 Groundwater, Stormwater, Seep Monitoring

After completing source control actions in accordance with Agreed Order No. DE 93TC-S163 and amendments, a two-year quarterly monitoring program related to the Taylor Way Property groundwater, stormwater, and intertidal bank seeps was initiated in January 2000 to evaluate source control effectiveness (CDM, 2001).

Groundwater

Groundwater monitoring was conducted periodically between March 1994 and January 2000 and on a quarterly basis during 2000 and 2001. KJC also conducted a round of groundwater monitoring during its Phase II ESA in October/November 2002. Arsenic concentrations in groundwater exceed the MTCA Method A cleanup level in several surface and second aquifer wells. Arsenic concentrations at MW9 declined significantly following source material removal from this area. Otherwise, metals concentrations varied between sampling rounds at individual well locations. Overall, metal concentrations in groundwater appeared to be relatively stable within certain concentration ranges for individual wells.

Stormwater Sampling

Stormwater sampling occurred in 2000 and 2001, in conjunction with the groundwater monitoring program. Following completion of the new stormwater drainage system, dry weather discharges were not observed at the storm drain outfall, indicating groundwater no longer infiltrates into the system. However, metals continued to be detected in wet weather discharges, indicating a source of metals in surface runoff.

Seeps

The intertidal bank was checked for seeps during each quarterly groundwater sampling round, but seeps have not been observed since April 1999, after completion of the bank interim action.